

# Ship Resistance and Propulsion - Web course

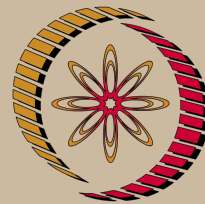
## COURSE OUTLINE

Components of ship resistance - frictional, wave and other components; Dimensional analysis; Bulbous bow and ship form effects; Shallow water effects; Added resistance; Ship model tests and resistance data presentations - methodical series data; Resistance of advanced marine vehicles.

Powering and efficiency components; Screw propeller geometry; Propeller theories; Dimensional analysis; Hull-propeller interaction; Propeller model tests; Cavitation; Propeller design; Strength of propellers and manufacturing process; Sea-trials; Other propulsion systems and applications.

## COURSE DETAIL

Module No	Topics	No. of Hours
1	Components of ship resistance, dimensional analysis, Froude's hypothesis and model analysis, frictional resistance, wave resistance, wind resistance; effect of bulbous bow and ship form on resistance, shallow water effects, added resistance.	8
2	Ship model tests and resistance data presentations, Prandtl's method; Methodical series data - BSRA, Series 60; resistance of special types of hull forms and advanced marine vehicles.	8
3	Powering and efficiency components, screw propeller geometry, Propeller theories - momentum, blade element and circulation theories, vortex lattice method and CFD applications.	8
4	Dimensional analysis and similarities; Hull-propeller interaction; Open water and self-propulsion tests; Propeller cavitation - types, prevention, tests; Design of screw propellers - series charts, selection of engine.	8
5	Strength of propellers and manufacturing process; Powering of ships and sea-trials; Other types of propellers - shrouded, CPP, vertical axis, super-cavitating, podded, azimuth, podded propellers.	8
Total		40



NP-TEL

NPTEL

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## Ocean Engineering

### Pre-requisites:

1. Basic course in Fluid Mechanics/ Hydrodynamics.

### Coordinators:

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## References:

1. Lewis, E.U; 'Principles of Naval Architecture' (2<sup>nd</sup> Rev.) Vol. 2, 1989, SNAME New York
2. Harvald S.A.; "Resistance and Propulsion of Ships", John Wiley & Sons., 1983
3. Ghose,J.P and Gokarn,R.P, "Basic Ship Propulsion", Allied Publishers, 2004
4. Tupper,E.C;Introduction to Naval Architecture, Butterworth-Heinemann, 1998.
5. Carlton J, Marine Propellers and Propulsion, Elsevier 2007.